in sight, an incrédible exhortation to the rowers and rivalry took place. The ships of the barbarians indeed went faster, because for a length of time they had been accustomed to the handling of the oars; but the ships of the Greeks preceded them by a small interval; and, having finished their voyage as quickly as possible, they immediately sprang upon the strand like wrestlers; and, indeed, the leading ships of the Carthaginians attacked the aftermost ships of Agathocles, having come within range of missiles." —Diod. Sic., lib. xx., ch. 5, 6.

'O δ' 'Αγαθοκλῆς περικατάληπτος ἤδη γενόμενος, ἐπιλαβούσης τῆς νυκτὸς, ἀνελπίστου σωτηρίας ἔτυχε. Τῇ δ' ὑστεραίᾳ τηλικαύτην ἔκλειψιν ἡλίου συνέβη γενέσθαι, ὥστε ὁλοχερῶς φαινῆναι νύκτα, θεωρωμένων τῶν ἀστέρων πανταχοῦ. . . . 'Εξ δ' ἡμέρας καὶ τὰς ἴσας νύκτας ἀυτῶν πλευσάντων, ἀποφαινούσης τῆς ἕω ἕω, παραδόξως ὁ στόλος τῶν Καρχηδονίων οὐκ ἄποθεν ὢν ἑωράθη.—Diod. Sic., Lib. xx., ch. 5, 6.

From this narrative it can be clearly shown that Prof. Newcomb is mistaken when he says that "*we do not know on which side of Sicily he sailed.*" It is quite certain that the eclipse occurred before the expedition had weathered the promontory of Pachynus, or had made any sensible westing in their voyage.

The total distance, on a coasting voyage from Syracuse to Carthage, is 350 English miles, and the distance from Syracuse to Cape Pachynus is forty miles. Now, the whole time of the voyage was six days and as many nights, together with a portion of a night at Syracuse, and a portion of a day near Carthage (the stone quarries). Allowing six hours each to these, we have :—

	Hours.
Part of night of outset at Syracuse	6
Six days and as many nights	144
Part of day near Carthage before landing at the "Stone Quarries"	6
	156

This is the minimum time allowable from the narrative, and any longer time allowed will strengthen my argument. The rate of rowing during the voyage was, therefore,

$$\frac{350}{156} = 2\cdot25 \text{ miles per hour.}$$

At this rate of rowing it would require 17h. 48m. to reach Cape Pachynus, a distance of forty miles; so that if the expedition sailed at midnight, it would have been off Pachynus, to the eastward, at 5 P.M., which is the time assigned by Petavius for the middle of the eclipse (Syracusan time). It is, therefore, perfectly clear that if the expedition had got so far to the westward as to allow of the coefficient (6·11), the eclipse must be thrown into the wrong day, which is inadmissible.

If Delaunay is to be trusted, the expedition must have gone out of the Mediterranean into the Atlantic before the coefficient 6·11 could be verified. He says :—"Nous avons dit que la durée du jour augmentait d'une seconde dans l'espace de 100,000 ans. Mais cela se produit progressivement, de telle manière que ces augmentations successives des jours s'ajoutent, et au bout d'un grand nombre de jours, font un total appréciable. Si on remonte à une époque, de 2400 ans époque à peu près, à laquelle on rapporte les éclipses historiques dont on a parlé, on voit que l'observation de l'une de ces éclipses a dû être faite $1^{\mathrm{h}}\frac{3}{4}$ plus tôt que si le ralentissement du mouvement de rotation de la terre n'avait pas existé.

"La variation relative aux anciennes éclipses va donc jusqu'à $1^{\mathrm{h}}\frac{3}{4}$. Ainsi une éclipse a été observée à un certain moment $1^{\mathrm{h}}\frac{3}{4}$ plus tôt qu'elle ne l'aurait été sans le ralentissement.

"Prenons les trois éclipses principales rapportées par l'histoire. Celle de Thalès, arrivée 585 ans avant J.—C., a été vue en Asie Mineure; sans le ralentissement du mouvement de rotation de la terre, on l'aurait vue dans l'ile de Sardaigne.

"Celle de Darisse (557 ans avant J.—C.) a été observée en Perse; on l'aurait vue dans la régence de Tripoli, sans le ralentissement.

"Enfin, celle d'Agathocle (310 ans avant J.—C.), signalée près de Syracuse, aurait dû se montrer près de Cadix."[1]

STRIDULATING ORGANS IN SCORPIONS

At the September meeting of the London Entomological Society, Mr. J. Wood-Mason announced the discovery of tridulating organs in scorpions. While recently working at the anatomy of a species allied to *S. afer*, he had met with structures which, from his familiarity with the analogous ones in other arthropods, crustaceans as well as insects, he had at once without hesitation determined to be sound-producing apparatus—even before he had found that sounds could be produced by them artificially by rubbing the parts together or accidentally in the mere handling of alcoholic specimens. He had, however, been enabled to place the matter beyond all doubt, for while at Bombay waiting for the steamer, he had obtained, by a happy chance, from some Hindustani conjurors, two large living scorpions belonging to another species of the same type; these, when fixed face to face on a light metal table and goaded into fury, at once commenced to beat the air with their palps and simultaneously to emit sounds which were most distinctly audible not only to himself, but also to the bystanders, above the clatter made by the animals in their efforts to get free, and which resembled the noise produced by continuously scraping a piece of silk woven fabric, or, better still, a stiff tooth-brush with one's finger-nails. The species—a gigantic one from the Upper Godaveri district—in which he had first observed stridulating organs, had these organs more highly developed than in the one experimented upon at Bombay, and must stridulate far more loudly, for by artificially rubbing the parts together in a dead alcoholic specimen he could produce a sound almost as loud as, and very closely similar to, that made by briskly and continuously drawing the tip of the index-finger backwards and forwards in a direction transverse to its coarse ridges, over the ends of the teeth of a very fine-toothed comb. The apparatus, which, as in the *Mygale*, is developed on each side of the body, was situated—the *scraper* upon the flat outer face of the basal joint of the palp-fingers; the *rasp* on the equally flat and produced inner face of the corresponding joint of the first pair of legs. On separating these appendages from one another, a slightly raised and well-defined large oval area of lighter coloration than the surrounding chitine was to be seen at the very base of the basal joint of each; these areæ constituted respectively the *scraper* and the *rasp*; the former was tolerably thickly but regularly beset with stout, conical, sharp spinules curved like a tiger's canine, only more towards the points, some of which terminate in a long limp hair; the latter crowdedly studded with minute tubercles shaped like the tops of mushrooms. He had met with no stridulating organs in this position in any scorpions besides *S. afer* and its allies; but in searching for them in other groups he had come to the conclusion that the very peculiar armature of the trenchant edges of the palp-fingers in all the *Androctonoidæ*, and in some at any rate of the *Pandinoidæ* (no *Telegonoidæ* or *Vejovoidæ* had yet been examined), was nothing but a modification for the same purpose, for the movable finger of this pair of appendages when in the closest relation of apposition to its immovable fellow could most easily be made to grate upon it from side to side so as to produce a most distinct crepitating sound; but when separated from it ever so little appeared to be incapable of the slightest lateral movement. It was his intention on his return to India to endeavour to determine this question, as well as many others relative to the species in which the presence of sound-producing apparatus had now been demonstrated by careful observation and experiment upon living animals.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

Oxford.—Mr. Thomas Whittaker, from the Royal College of Science, Dublin, has been elected to a Natural Science Scholarship at Exeter College.

At Jesus College the following elections to Welsh scholarships have been made :—In mathematics, Mr. David Davies, from the College, Llandovery; in science, Mr. William Williams, from Dolgelly Grammar School.

The Commissioners commenced their sittings at the Clarendon Hotel on Monday. The proceedings of the Commissioners were of a formal character, but Tuesday, it was understood, they would proceed to take evidence.

Cambridge.—The master and seniors of Gonville and Caius College will proceed in December to elect a prælector in chemistry, in succession to the late Mr. Richard Apjohn. The duties of the prælector will be to take charge of the college laboratory, to prosecute original research, to instruct in chemis-

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[1] "Cadix," pp. 18, 19.

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try the members of the college, and such members of the university as the master and seniors may from time to time direct.

LONDON.—The London Ladies' Educational Association opened its tenth session at University College for day lectures on Monday. Most of the evening lectures—intended chiefly for governesses and candidates for public examinations open to women—began a fortnight ago. In the past session of 1876-77 there was a decrease in the number of students as compared with the preceding session, in which the number had been greatly in excess of any previous year. There was, however, but a very slight diminution last year in the total amount of fees received, which rose considerably above the former level, the students, as a rule, showing a desire to avail themselves of a regular course of study by attending a larger number of classes. Moreover, the number presenting themselves for examination showed a very marked increase. The range of subjects offered to ladies in the coming session is fully as wide as in any preceding one, and comprises the language and literature of England, France, Germany, and Italy; Greek and mathematics, in elementary and advanced classes; physiology and hygiene; physics; English history, in two classes, intended as a preparation for the Cambridge higher local examinations for women; English Constitutional History; and history of Grecian literature and art; to which will be added, next term, an additional course of Modern History, and a course of lectures on Architecture. Besides these classes, which are for ladies only, ladies are admitted as regular students to the following classes in the college:—Anglo-Saxon, Higher Senior Mathematics, Philosophy of Mind and Logic, Political Economy, Jurisprudence, and Roman Law. Ladies are also permitted to receive practical instruction in the physical laboratory of the college, whilst the Fine Art Department has from its commencement always been open to them.

MANCHESTER.—The Dalton Chemical Scholarship has been awarded to Mr. C. F. Cross. Mr. Cross presented an original investigation upon "Normal primary heptyl alcohol, and its derivatives."

The Dalton Mathematical Scholarship has been awarded to Mr. E. T. Littlewood.

Prof. Boyd Dawkins, M.A., F.R.S., began on the 22nd inst. a course of six museum lectures on "Man's place in the tertiary period." These lectures are open to the public at a small nominal fee.

The session of the evening classes was opened on the 15th inst. by an address on "The Great Masters since Handel and Bach, with especial reference to the form of their compositions." The address was delivered by Mr. Hecht, Lecturer on Music, and was illustrated by selections from the masters' works, performed on the pianoforte.

LEEDS.—On Tuesday the foundation stone of the new Yorkshire College was laid by the Archbishop of York on the site of the Beechgrove estate, at Little Woodhouse, near Leeds, in the presence of a large gathering of friends and subscribers to the undertaking. Dr. Heaton, the chairman to the council of the College, delivered a short statement in the nature of a history of the college from its initiation and its establishment down to the present time. With these details our readers are already familiar. The cost of the site has been 13,000*l*.

BRISTOL.—On Saturday next, October 27, the Dean of Westminster will give a public address to the students of University College, and those interested in its success. The introductory lectures have been duly delivered, and in most cases attracted large audiences, and were well reported in local papers.

ABERDEEN.—*Apropos* of a recent correspondence in the *Times*, the following fact is of some interest:—

At a recent meeting of the Aberdeen University Court a letter was read from Sir Louis Mallet, Secretary to Lord Salisbury, asking what special provision the University would make for superintending the conduct of students selected for the Indian Civil Service during their two years of probation. In reply, the court adopted a motion, in which they resolved respectfully to inform the Secretary of State for India that the University could not undertake to institute any separate or severer system of oversight or discipline for one class of students than for another, and that the present system had been found in practice to be perfectly effectual in securing the steadiness, moral training, and good behaviour of the students.

A memorial from the University Council, asking the court to take steps to institute evening lectureships in science and art, was referred to the Senatus for a report.

DUBLIN.—Prof. Emerson Reynolds will commence a course of lectures on General and Medical Chemistry on every Tuesday, Thursday, and Saturday from November 1 to March 31 following. The first course of Practical Chemistry will comprise laboratory instruction in Qualitative Analysis (including Spectrum Analysis), commencing in Michaelmas Term; Volumetric and Simple Gravimetric Analysis, commencing with Hilary Term; Organic Preparations and Analysis, commencing with Trinity Term. The second, or advanced, course of Practical Chemistry will comprise instruction in the higher branches of Experimental and Analytical Chemistry, and in Methods of Research.

Prof. Macalister, M.D., will commence a course of lectures on Zoology in November, to be continued through each term until the end of June.

Prof. E. P. Wright, M.D., will commence a course of lectures on the Morphology of the Cells and Tissues of Plants, and one on the Natural History of Algæ and Fungi in November.

CORK.—Prof. J. Reay Greene has resigned the Professorship of Zoology and Botany in the Queen's College, Cork, retiring on a pension. There is, however, no vacancy, as Prof. Harkness will lecture the students on these subjects.

GALWAY.—Prof. Cleland, M.D., F.R.S., has resigned the Professorship of Anatomy in the Queen's College, Galway, having been elected to the valuable Professorship of Anatomy in Glasgow College, vacant by the resignation of Prof. Allen Thomson. The vacancy in the Queen's College, Galway, will be filled up by H.E. the Lord-Lieutenant of Ireland on October 27.

LANCASTER.—A very fine set of new buildings for the Lancaster Royal Grammar School was opened on September 24. The buildings include a well-fitted laboratory, erected at the expense of W. Bradshaw, Esq., placed at some distance from the main building. It is a pleasant, well-lighted room, thirty feet by twenty feet. The whole school is taught physics, and every boy will pass through a course of chemistry at about the fourth form stage. We hope the authorities will feel encouraged soon to introduce other branches of science as a regular part of the curriculum.

AMSTERDAM.—A university has been opened at Amsterdam.

SCIENTIFIC SERIALS

Reale Istituto Lombardo di Scienze e Lettere, Rendiconti, vol. x. fasc. xv.—New contribution to the efficacy of the elastic ligature in surgery, by M. Scarenzio.—Gleanings in the Zoological Museum of Pavia, by M. Pavesi.—Note by M. Curioni on the contents of his work, "Applied Geology of the Lombardy Province."—On microphytes, which produce certain diseases in plants, by M. Cattaneo.—Physico-chemical researches on the different allotropic states of hydrogen, by M. Tommasi.

Journal de Physique, September, 1877.—From this number we note the following papers: On the application of a new apparatus for the determination of visual astigmatism, by M. Javal.—On the spectrum of the electric spark in a compressed gas, by A. Cazin. The author made two series of experiments, one in which he simply observed the spectrum directly by means of the spectroscope, and the other in which he photographed the spectra and thus obtained more accurate results.—Experimental determination of the principal elements of an optical system, by A. Cornu.—On the currents produced by a liquid passing through a tube, by E. Edlund.—On the spectra of chemical compounds, by P. Moser.—On the modes of crystallisation of water and the causes of the various aspects of ice, by Raoul Pictet.—On the influence of light on the electrical resistance of metals, by R. Boernstein.

Zeitschrift für wissenschaftliche Zoologie, vol. 29, part 2 (July).—H. Reichenbach, on the early development of the fresh-water crayfish, 75 pp. 3 plates.—H. Ludwig, on Rhopalodina (class echinodermata).—O. Bütschli, on the process of division of cartilage-cells; on the development of *Paludina vivipara*, in relation to Bobretzky's and Lankester's recent papers; on the development of *Neritina fluviatilis*, and on the segmentation process and formation of the blastoderm in *Nephelis vulgaris*.

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